

## Claims

1. A light emitting device comprising:  
a substrate;  
5 a gallium nitride layer provided above the substrate;  
an N-type gallium nitride layer provided above the gallium nitride layer;  
at least one  $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$  multi-layer ( $0 < x, y < 1$ )  
provided above the N-type gallium nitride layer, x being  
10 different from y; and  
a P-type gallium nitride layer provided above the  $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$  multi-layer.

2. The device according to claim 1, wherein the  $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$  multi-layer has a plurality of pits formed thereon.

3. The device according to claim 2, wherein the number of the pits is 50 or less per area of  $5\mu\text{m} \times 5\mu\text{m}$ .

20 4. The device according to claim 1, wherein each layer of the  $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$  multi-layer has a thickness of 1~3000 Å.

25 5. The device according to claim 1, wherein the  $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$  multi-layer has a photoluminescence characteristic of a yellow band intensity/N-doped GaN intensity ratio of 0.4 or below.

30 6. A light emitting device comprising:  
a first gallium nitride layer;  
a second gallium nitride layer;  
an active layer formed between the first gallium nitride layer and the second gallium nitride layer; and  
35 a multi-layer formed between the second gallium nitride layer and the active layer to intercept an applied

electrostatic discharge.

7. The device according to claim 6, wherein the multi-layer is an  $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$  multi-layer ( $0 < x, y < 1$ ).

8. The device according to claim 6, wherein the multi-layer has a plurality of pits formed thereon.

9. The device according to claim 6, wherein the multi-layer has a plurality of layers of different In content, the plurality of layers being alternately stacked in the multi-layer.

10. The device according to claim 6, wherein the multi-layer has a plurality of layers of different growth temperatures, the plurality of layers being alternately stacked in the multi-layer.

11. The device according to claim 6, wherein the multi-layer has two layers of different growth temperatures, the two layers being formed at 800°C and 900°C, respectively.

12. The device according to claim 6, wherein the multi-layer has a plurality of pits formed thereon, the number of the pits being 50 or less per area of  $5\mu\text{m} \times 5\mu\text{m}$ .

13. The device according to claim 6, wherein the multi-layer has a plurality of hexagonal pits formed thereon.

14. The device according to claim 6, wherein each layer of the multi-layer has In content of 3% or less with respect to Ga and In content.

15. The device according to claim 6, wherein each layer of the multi-layer has In content of 2% or less with respect to Ga and In content.

16. The device according to claim 6, wherein the second gallium nitride layer is an N-type GaN layer.

17. A method for manufacturing a light emitting device,  
5 the method comprising the steps of:

forming a buffer layer above a substrate;

forming an N-type gallium nitride layer above the  
buffer layer;

10 forming a multi-layer above the N-type gallium nitride  
layer, the multi-layer including layers of different growth  
temperatures;

forming an active layer above the multi-layer; and

forming a P-type gallium nitride layer above the active  
layer.

15 18. The method according to claim 17, wherein the  
multi-layer has a plurality of InGa<sub>x</sub>N layers of different In  
content, the InGa<sub>x</sub>N layers being alternately stacked in the  
multi-layer.

20 19. The method according to claim 17, wherein the  
multi-layer has a plurality of layers of different growth  
temperatures formed thereon, the different growth  
temperatures being a high temperature and a low temperature,  
25 respectively.

20. The method according to claim 19, wherein the high  
temperature is 900°C .

30 21. The method according to claim 19, wherein the low  
temperature is 800°C .

35 22. The method according to claim 17, wherein the  
multi-layer is formed using TMGa, TMin, ammonium, and  
nitrogen.

23. The method according to claim 17, wherein each layer of the multi-layer has a thickness of 1~3000 Å.

5 24. The method according to claim 17, further comprising the step of forming a slow-growth gallium nitride layer above the buffer layer.

10 25. The method according to claim 24, further comprising the step of forming an undoped gallium nitride layer above the slow-growth gallium nitride layer.